

Callus Formation and Plant Regeneration from Immature Embryos of Pigmented Upland Rice (*Oryza sativa* cv. Tadong)

ABSTRACT

The application of biotechnology in upland rice improvement programs depends on the availability of efficient regeneration protocols. Although protocols for shoot regeneration of upland rice are available, none has been reported for pigmented cultivars. This study reports on a protocol for callus induction and regeneration of Tadong, a pigmented upland rice cultivar from Sabah. For callus induction, immature embryos were cultured on media containing 2,4-Dichlorophenoxyacetic (2,4-D) at various concentrations (0 – 2.5 mg/L) and on different types of media (MS; MSB5; N6B5; N6). To induce shoot regeneration, callus explants were cultured on MS medium supplemented with combinations of 6-Benzylaminopurine (BAP) at various concentrations (0 – 3.0 mg/L) and 1-Naphthaleneacetic acid (NAA) at 1.0 mg/L. To induce shoot development, callus explants were pre-treated with Thidiazuron (TDZ) at various concentrations (0-1.0 mg/l) and exposed to different desiccation periods (0 – 72 hours). 2,4-Dichlorophenoxyacetic at 2.5 mg/L and N6B5 medium resulted in the highest percentages of explant forming callus which were 60.3 ± 17.0 % and 58.7 ± 9.8 % respectively. The regeneration media failed to induce shoot on callus explants, instead, green spots were formed on the surface of the callus. The green spots were stimulated to develop into shoots when the callus explants were pre-treated with 0.5 mg/L TDZ or exposed to partial desiccation for 24 h, the percentages of explant forming shoot were 35.7 ± 4.8 % and 47.7 ± 6.8 % respectively. Shoots developed into complete plants on hormone-free MS medium and acclimatized.